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GOPHER DESTRUCTION

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OTTAWA, September 22, 1916.

The Honourable,
The Minister of Agriculture,
Ottawa, Ont.

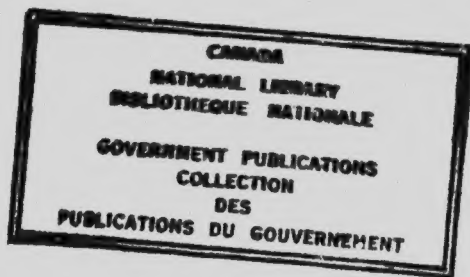
SIR,—I have the honour to transmit herewith the manuscript of Second Series Bulletin No. 31, entitled "Gopher Destruction." This pest has done and is doing a great deal of destruction in our Western Provinces. While we have heretofore published considerable literature on the subject, we have never brought out a bulletin on gopher destruction as complete and authoritative as the present. The information contained herein is, in my opinion, the best available at the present time, and was compiled by myself from material submitted by the Superintendents of our prairie farms and from other sources. I would recommend that this bulletin be published at an early date.

I have the honour to be, sir,

Your obedient servant,

J. H. GRISDALE,

Director, Dominion Experimental Farms.



GOPHER DESTRUCTION.

INTRODUCTION.

Among the worst enemies of the farmer on the prairies in the provinces of Manitoba, Saskatchewan, and Alberta are the various species of gopher. These ground squirrels make their homes in holes burrowed through the soft soil of the prairies and live on the herbage in the more or less near neighbourhood.

VARIETIES OF GOPHER.

Two types of gopher are commonly found on the Canadian prairies, the ordinary gopher (*Citellus Richardsoni*), and the mole or pocket gopher; while a third, the squirrel tail gopher (*Citellus Franklini*), frequents the more bushy country and does, as a rule, relatively small damage.

DAMAGE CAUSED BY GOPHERS.

These rodents are exceedingly difficult to keep in check, and they work each year immense damage to the crops of the farmers in these prairie provinces. Living in holes in the ground, mounds of earth from the digging of which dot the prairie wherever one goes, sleeping all the winter, and awaking in the spring to feed on the tender green young plants in the fields and gardens, they do an incalculable amount of damage every year, and thousands of acres, which would otherwise be highly productive, are rendered of small value because of their depredations every spring. The edges of fields, especially when situated near unused or range land, are often cleaned bare of young plants when they are just above the ground, and other parts of the fields are partially cleared. Not only this, but the working of the land and the gathering of the harvest are made more difficult by the presence of the mounds of earth thrown out when the gopher burrows are being dug.

As illustrating in some measure the damage wrought by the gopher, the following paragraph from the Experimental Station records at Scott, Sask., where open prairie comes up to the Station farm on two sides, will be of interest.

"During the summer of 1915 it was noted that gophers were at work along the edges of two fields on the Scott Station. One field was in oats, the other in barley. With a view to ascertaining the actual losses experienced from these animals, the parts of the fields attacked by them were harvested and threshed separately.

The following table will show the losses sustained:—

Loss caused by Gophers, Season 1915.

Crop.	Yield per acre on part of field not attacked by gophers.	Yield per acre on part of field attacked by gophers.	Loss per acre caused by gophers.
Oats.....	90 bush. 19 lb.	75 bush. 14 lb.	11 bush. 5 lb.
Barley.....	40 " 41 "	22 " 20 "	18 " 21 "

The damage done is usually greatest in a sparsely settled district where the areas under cultivation are scattered and often limited in area. The little pests are extremely fond of tender grain plants and will travel long distances to reach them. Hence when a field of grain is preyed upon, not only by the gophers living on the land itself, but also by those living from a distance of a quarter to even three-quarters of a mile on all sides, the damage done is serious. This accounts for the occasional apparent uselessness of applying poison, as this habit of coming long distances to appetizing forage ground is overlooked and the farmer naturally comes to the conclusion that the poisoning was not effective. There is, however, not likely to be much trouble with gophers coming from adjoining land that is in crop.

NATURAL ENEMIES.

The natural enemies of the gopher are coyotes, badgers, skunks, weasels, snakes, hawks, and owls. Many gophers, especially on the waste lands, are destroyed by hawks and owls, yet unfortunately, whenever one of these birds appears near the average farm in the West, it is greeted with a shot, the farmer forgetting that the occasional theft from the barnyard by these birds is usually much more than offset by the number of gophers killed by them. If it were not for the useless bird destruction, many more gophers, whose ravages in the farmer's crops are much greater than those of the hawk in his barnyard, would be killed.

METHODS OF CONTROL OR EXTERMINATION.

There are many methods of destruction but only a few are practicable on the average farm. These methods are, poisoning, shooting, trapping, snaring, drowning and suffocating.

POISONING.

There are a number of patent gopher poisons on the market; very few of these, however, are to be recommended, and the only safe way to use such preparations is to demand a guarantee of effectiveness or to buy subject to analysis. Nevertheless, during the past few years certain of these preparations tried out on the branch Farms and Stations have proven quite satisfactory.

A tried and proven recipe that has been effective wherever properly handled is given below. One of the strong points in favour of this recipe is its simplicity, while its cheapness is also an important consideration.

Recipe for Preparing Wheat for Poisoning Gophers.—Dissolve one ounce of strychnine or sulphate of strychnine in one quart of vinegar to which has been added one quart of hot water. Stir with a stick until all the strychnine is dissolved, boiling if necessary. Add one pound of sugar or one pint of molasses, and a teaspoonful of oil of anise. Pour the hot solution over half a bushel of wheat, and, if necessary, add enough hot water just to cover all the wheat. Let the grain stand in the solution for 24 hours, and if any of the solution is then still unabsorbed, add a handful of shorts and stir the whole mixture well. Put a tablespoonful of the moist grain well into the entrance of each gopher hole.

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Caution.—As strychnine is a deadly poison, great care should be taken with all utensils used, and while mixing and handling poisoned grain, so that accidental poisoning of farm animals, children, and others may be prevented.

Cost.—The cost is not great. The four gallons prepared as indicated above should be enough to treat half a section of land and also to a distance of a quarter of a mile or more on the outside of the same. The ordinary retail price of strychnine sulphate is about \$1 to \$1.25 an ounce.

When to apply.—The first application should be made as soon as the snow is off the ground in the early spring. The gophers are then hungry, other food is scarce, and their numbers are only about one-third of what they would be a few weeks later. If an effective application is made at this time there is practically no more trouble during the season, except from those that come from outside.

Method of Distribution.—A good equipment consists of a pail of the poisoned grain suspended from the shoulder by means of a strap, and a dessert spoon with a long handle. The operator walks from end to end of the farm, each time covering a strip of not more than twenty-five yards on either side of the line he is following. In this way he is able to see every hole. He drops a spoonful of the poisoned grain well down each hole, thereby keeping it out of the reach of prairie chickens, and at the same time causing the gophers to die in their holes, where they are not a menace to anything else. After the farm has been thus covered, it is usually well to distribute the poison on a strip at least a hundred yards wide round the outside of the farm, in order to lessen the danger of inroads by gophers from adjacent land.

Dangers and Precautions.—The unfortunate point in the using of poisoned grain is that it kills many of our native birds, and it is needless to say that in distributing the poison care should be taken to prevent domestic animals getting enough to hurt them. The amount that would kill a gopher would not be enough to kill a domestic hen, but one scarcely cares to take chances. This risk can be minimized by placing the poisoned bait, as indicated above, as far down the entrance to the holes as possible with the long-handled spoon mentioned.

Grain, poisoned and put out as indicated, has been distributed by us in fields where horses, cattle, sheep and swine have been pasturing at the time and no loss due to poison has resulted up to the present. We have not tested the advisability of distributing poisoned grain in poultry yards, but believe the practice would be dangerous to the poultry.

Another method of poisoning that has been used with very good results in North Dakota is as follows:—

(1) Mix thoroughly one ounce strychnine alkaloid, (powdered), and one ounce baking soda.

(2) Sift this into three quarters pint of thin, hot starch paste, and stir to a creamy mass. The starch paste is made by dissolving one heaping tablespoonful of dry gloss starch in a little cold water, which is then added to three quarters pint of boiling water. Boil and stir constantly until a clear thin paste is formed.

(3) Add one quarter pint heavy corn syrup and a tablespoonful of glycerine, then stir thoroughly.

(4) Add one eighth ounce saccharine and stir thoroughly.

(5) Pour this poison solution over twenty quarts of clean oats and mix thoroughly so that each grain is coated. Prepare the poisoned grain twenty to forty-eight hours before using. For mixing small quantities an ordinary galvanized wash tub is convenient. For larger quantities a tight, smooth box may be used, and the mixing done with a spade.

(6) A teaspoonful of poisoned oats should be placed in each gopher hole on clean, hard ground, letting it scatter slightly as it falls (placed in this way it will not endanger the stock and birds). Do not put the poisoned grain on the loose dirt of the mound or of the holes. Each quart of the poisoned grain is sufficient to treat about sixty holes.

In case poisoning is being carried on near buildings where poultry is kept, or if it is desired or necessary to avoid endangering bird life, the poisoned grain should be placed some little distance down the gopher hole.

For poisoning the mole or pocket gopher, another method has been used. In one case, a grain of strychnine was put in a raisin, and the raisin was then dropped in the runway, which can readily be located by the difference in the firmness of the soil. Entrance to the thoroughfare used by the pocket gopher may be made by means of a sharp, round stick, the poisoned raisin inserted, and the opening covered. It was impossible to secure satisfactory results from this method, as the poison seemed too frequently to fail to reach its destination, as the mounds still made their appearance, though not in such large numbers.

OTHER METHODS OF DESTRUCTION.

The methods of shooting, trapping, snaring, drowning and suffocating are not very effective, as they take so much time, or are expensive; but when it is kept in mind that an average gopher litter is eight or ten, and that one gopher can easily destroy two or three bushels of grain, it will be seen that any method that results in the destruction of even one of these pests is to be recommended.

SHOOTING.

Shooting is an effective and sometimes exciting method of destroying the gopher, but it is rather slow and, in comparison with the poisoning method as outlined above, very expensive.

TRAPPING.

Trapping is a method which should be adopted where poisoning is not practicable, as in poultry runs, or to destroy the wanderers that come in from beyond the farm boundaries to the small fields about the house and gardens, after the main crop of gophers has been destroyed by poisoning. Traps must of course be visited frequently for emptying and resetting, as new victims are caught; but even so, a boy not otherwise employed can usefully occupy his time in looking after a few dozen

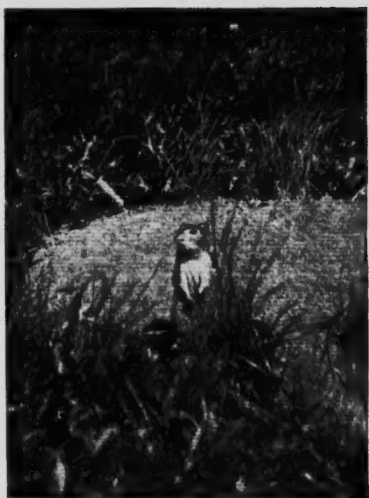
traps, placed in those parts of the farm where they will catch most gophers. Boys, as a rule, delight in killing such farm pests, and a bonus of one or two cents a head would save dollars on the crops, and add a little spice to the boy's life.

The Mole or Pocket Gopher.—Moreover, in the case of the mole or pocket gopher, trapping seems to be the best method of control. Since its burrows are entirely underneath the surface, and since the point in the runway at which he comes to the surface to deposit the earth excavated in the construction of the runway is closed with earth, there are no openings in the runway through which to introduce the poison readily. His habits of life thus render him comparatively safe from the poisoning method described above, and compel the adoption of trapping as the means of control or extermination. The pocket gopher digs a large number of runways which converge at



Mangel Field showing destruction of crop around a Gopher Hole; Gopher in foreground.

certain points. Traps should be placed in the bottom of the runway at this point of convergence. A slight excavation is necessary so that the pan of the trap is level with the bottom of the runway. The chain is carried to the surface at the side of the runway and fastened to a small picket. The opening is then covered with a small board or shingle and earth is placed on top to exclude the light. Traps so set and attended by a boy who makes regular rounds, will catch a large number daily, since many different families use the same run.



Characteristic attitude of the gopher.



Placing poison in the gopher holes.



The common Gopher of Western Canada.

DROWNING.

Drowning is not practicable on the average prairie farm, as it involves too much time and labour at a period when all available help is required for seeding and preparing the land.

SUFFOCATING.

The various methods of suffocation by heavy gases are extremely difficult, and are therefore not much used. Gasoline has recently been tried in the Western States, with, it is reported, fair success.

GOPHERS ON VACANT LANDS.

As gophers are found in large numbers on waste or unoccupied land, and since there are large areas of such land in the vicinity of most western farms, it becomes evident that it is not enough for a farmer to clear his own land of gophers, as a fresh colony will immediately take possession from the waste land near; the waste land as well as the farm itself must be attended to.

CO-OPERATION IN ATTACKS ON GOPHERS.

While in some districts, rural municipalities, farmers' unions, and even store-keepers, are co-operating, by the offering of prizes for the largest number of gophers killed in a certain period, and in this way hundreds of thousands are killed each spring, yet in many districts nothing like this is done, and the necessary work is left to individual effort. The offering of prizes to the young people of the community for this purpose would certainly greatly stimulate their efforts in this regard.

Where communities have acted in unison in distributing poison the results have been more generally beneficial than when only occasional farmers are using gopher poison. Organizations such as the local Farmers' Union have in many instances set apart a day known as "Gopher Day," when the whole community declares war and makes a general attack on the gophers. This idea is worthy of adoption by all such organizations in the West, and, when adopted, will certainly result in very materially reducing the loss due to gophers.

MUNICIPAL CONTROL.

According to the Provincial Law, the Rural Municipalities and Local Improvement Districts in Alberta have the power to levy a tax of two and a half cents per acre on unoccupied lands, to be expended on poison and for labour in distribution. A somewhat similar law is on the statute books of Saskatchewan.

It is possible something worth while could be done by the municipalities co-operating with the schools and allowing the children a bonus of, say, one cent per head for each gopher killed. Some municipalities in Saskatchewan adopted this method last year with great success.

Another practicable plan would be for the municipality to supply each farmer with sufficient poison for use on his own fields, and also on the prairie adjacent to them. The damage to the crops might thus be considerably lessened.

